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North of the Delta
Offstream Storage Investigation

Progress Report

Appendix Q: Sites and Colusa Reservoir Foundation Studies

February 2001

Integrated
Storage
Investigations

CALFED
BAY-DELTA
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Introduction

In July of 1997 the California Department of Water Resources, Northern District, Geology Section began investigating the Sites Reservoir and Colusa Reservoir Projects. These projects are in the Stone Corral, Funks, Hunters, and Logan Creek watersheds on the west side of the Sacramento Valley (Figure 1). The Sites Reservoir Project consists of two major dams, nine smaller saddle dams, and an inlet-outlet tunnel works structure (Figure 2). This project would create a reservoir with a total capacity of 1.8 million acre-feet. The Colusa Reservoir Project is similar to the Sites Reservoir Project, except it adds additional reservoir area to the north, increasing the storage capacity to 3.1 million acre-feet. This would be done by adding two additional major dams, seven smaller saddle dams, and replacing the nine saddle dams along the ridge between the two areas with a canal or tunnel to join the two cells. The outlet works would remain at the same location.

These reservoirs would store water for agricultural, environmental, and municipal use; provide some flood control; and provide water-related recreation.

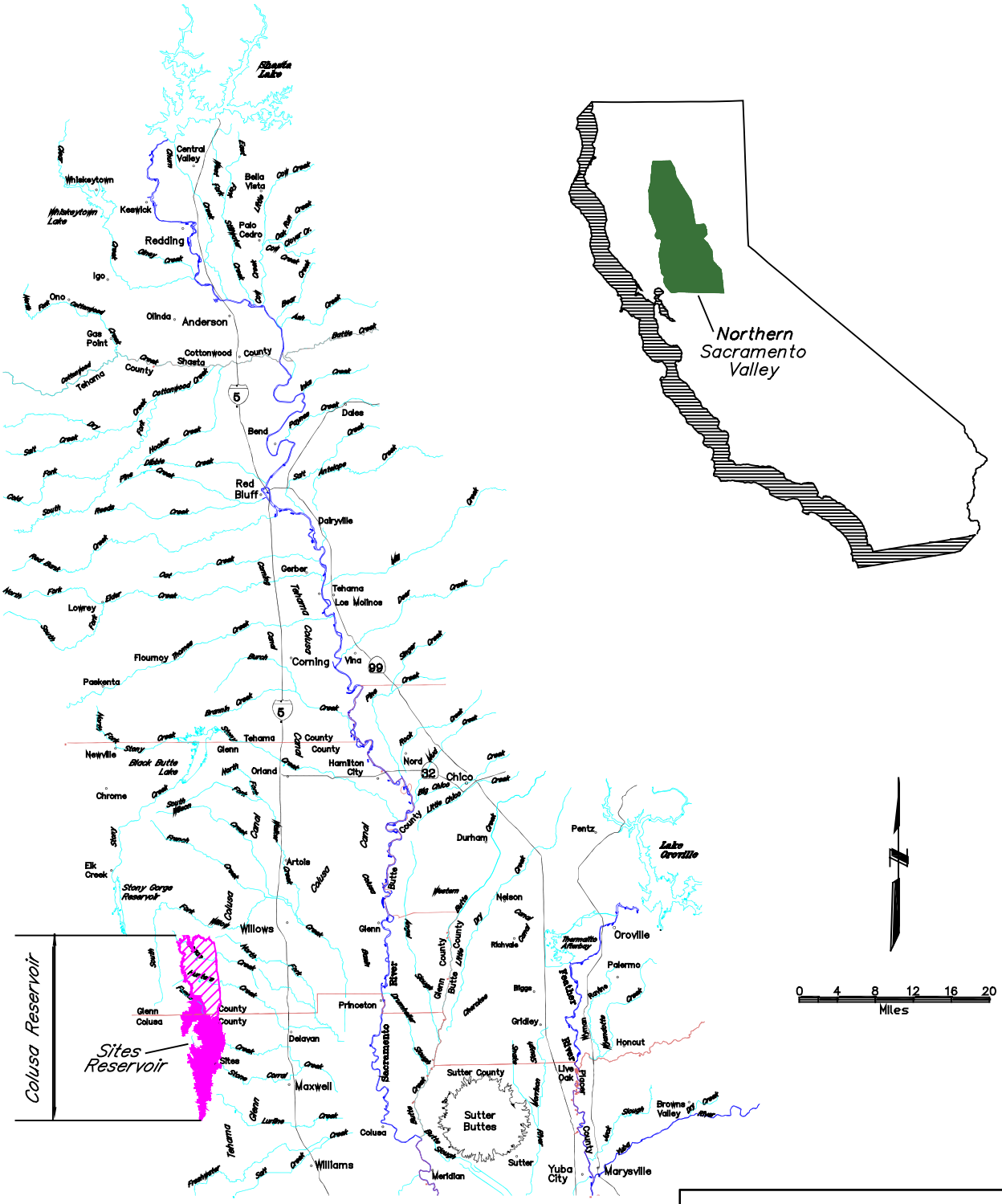
Purpose and Scope

The purpose of this investigation is to determine the geologic suitability of the foundations for the proposed structures and to provide engineers with adequate geologic data to develop designs and construction cost estimates. Seven sites were mapped in both projects between May 1998 and November 1999. These include four major dam sites, two saddle dam sites, and the outlet works site. Six of these sites were drilled.

A total of 12 diamond core holes and 6 auger holes were drilled, and the core holes were water pressure tested at the Sites, Golden Gate, and Owens Dam sites from May through October of 1998. An additional 8 core holes and 10 auger holes were drilled at the Golden Gate inlet-outlet works and the Sites saddle dams from June through July of 1999. Locations of geologic exploration are shown on Figure 2 and Plates 1, 5, 9, 11,12,13. Photographs, drilling and sampling logs, and drilling chronologies are in Technical Memorandum A.

Double packer water pressure tests were performed in conjunction with the core drilling to determine foundation permeability and to estimate grout takes. These tests and analyses are summarized in this report and presented in detail in Technical Memorandum B. Piezometers were placed in most of the drill and auger holes, and groundwater levels were monitored monthly. Well completion forms and hydrographs of these water levels are summarized in this report and presented in detail in Technical Memorandum C. Seismic refraction surveys were performed at the Golden Gate Dam site and outlet works to determine seismic velocities to help estimate stripping and rippability of the foundation materials. These results are summarized in this report. The technical memoranda are published separately.

FIGURE 1



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LOCATION OF SITES & COLUSA RESERVOIR PROJECTS

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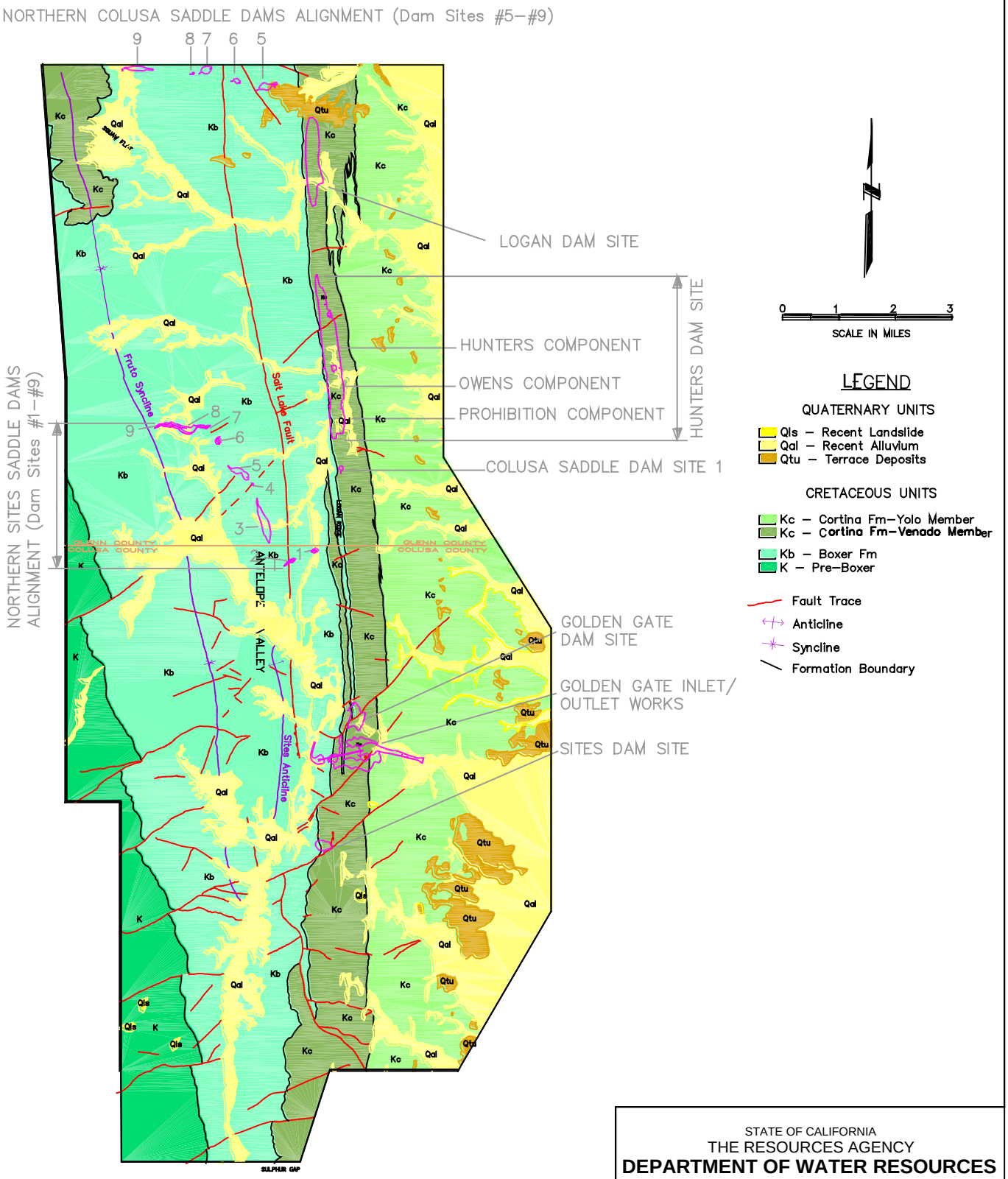
FIGURE 2



NOTES: Sources of geological data include geologic map interpretation, Brown and Rich (1961), U.S. Geological Survey (1972) and USBR (1963).

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LOCATION AND GEOLOGIC MAP OF THE SITES AND COLUSA RESERVOIR PROJECTS

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